

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Tatsuya Masuki et al.

Application No.: 10/616,538

Confirmation No.: 1953

Filed: July 9, 2003

Art Unit: 1772

For: RESIN CONTAINER

Examiner: W. Aughenbaugh

DECLARATION OF YOSHIHIRO KAYANO UNDER 37 CFR 1.132

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

1. I, Yoshihiro KAYANO, declare and say that I am a resident of Japan. My residence address is 11-Bankan, No. 907, Higashinomachi, 3-1, Ryokuen 4-chome, Izumi-ku, Yokohama-shi, Kanagawa-ken, Japan.

2. I currently hold the position of group manager of the group belonging one of inventor Hisashi TAHARA of U.S. Patent Application Serial No. 10/616,538 in Mitsubishi Engineering-Plastics Corporation (Assignee) and engage the study of polymer processing technology especially injection molding and CAE (refer to USP 6,866,811, Polymer 38 (8) (1997) pp. 1885-1902, Polymer 39 (4) (1998) pp. 821-834, Polymer 39 (13) (1998) pp. 2835-2845 and Polymer 37 (20) (1996) pp. 4505-4518).

3. I have read and am familiar with U.S. Patent Application Serial No. 10/616,538 ("the '538 application") and certain work related to the invention described in that application. I have read and understand the Office Action dated December 4, 2006 (the "Office Action"), in connection with the '538 application. I

have also reviewed U.S. Patent No. 5,648,136 to Bird et al., which the Examiner has cited in the Office Action.

4. I understand that in the Office Action, the Examiner has taken the position that the Bird patent describes "injection molding" of a molded product. I do not agree.

5. The Examiner points to the Bird patent, at Col. 12, lines 44-58, as showing that a molded product is produced by injection molding. However, in that paragraph, the Bird patent states that "a web 200 of a flexible thermoplastic polymer is supplied . . . by continuous injection molding to a mold or die 204 (which may be a pair of matched male and female dies) that thermoform the web." In my opinion, this process would not be called "injection molding" by one of ordinary skill in the art.

6. Injection molding is a process in which a material is heat-melted, and the molten material is injected and filled into a cavity or mold which has been previously assembled and closed. The material is solidified or cured and then removed from the mold to obtain a molded product.

7. In contrast to injection molding, thermoforming is a process in which a thermoplastic resin sheet is heated and softened; the sheet is formed while in the softened condition to give a shape, and then cooled to obtain a product. One kind of thermoforming is known as "matched mold forming," in which the heated, softened thermoplastic resin sheet is pressed between a male mold and a matching female mold to form a product.

8. Because injection molding and thermoforming are different processes, products made by injection molding differ from products made by thermoforming.

(a) For example, in injection molding, molten material is injected and filled into a cavity or mold through a gate or opening in the mold. When the molded product is removed from the mold, it will have a "gate mark" where the gate was in the mold. A thermoformed product, which is not made by injecting molten material through a gate, will not have gate marks.

(b) When a thermoplastic sheet is thermoformed to produce an article, and the thermoformed product is then cut away from the remaining sheet material, the thermoformed product will have a "trimming mark" where the article was cut away from the remaining sheet material. An injection molded article will not have trimming marks.

(c) In the thermoforming process, the thermoplastic sheet is heated and softened and formed to the desired shape. Different portions of the sheet are expanded or stretched differently. For example, in thermoforming a container shape from a sheet of thermoplastic material, a corner portion of the container is expanded so that the sidewall thickness at the corner portion becomes thinner. Therefore, the thickness of the container formed by thermoforming is relatively non-uniform. See, e.g., ANTEC1999, Preprint ("Optimization of Thermoforming with Process Modeling" by R. DiRaddo et al.) attached herewith. In contrast, an injection molded article will have a thickness determined by the dimensions of the mold, and will generally be more uniform in thickness.

8. In my opinion, the cited paragraph of Bird describes production of a carrier tape by thermoforming a web, and specifically describes "matched mold forming." As Bird states, "[m]old 204 thermoforms the pockets" of the carrier tape (emphasis added). Even if the web 200 of thermoplastic resin is formed by continuous injection molding, one of skill in the art would not refer to the finished product of Bird (the carrier tape) as being made by injection molding.

9. In my opinion, the portion of the Bird patent cited by the Examiner does not describe injection molding of an article. Moreover, in my opinion, one of ordinary skill in the art can distinguish an injection molded article from a thermoformed article.

10. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or

both, under Section 1001 of Title XVIII of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

June 22, 2007
Dated


Yoshihiro KAYANO